

**REMARKS**

Claims 1-30 were pending in this application. Claims 1-30 were cancelled, without prejudice or disclaimer. Claims 31-52 were previously added. No new claims are added.

Claims 31 and 41 have been amended. No new matter has been added and support for the amendments can be found throughout the specification, including the drawings, as filed.

As a result, claims 31-52 remain pending for examination; of which, claims 31, 41, and 49 are independent claims.

Rejection under 35 U.S.C. § 102

Claims 31, 32, 36-38 41-43, and 49 stand rejected under 35 U.S.C. § 102(b) as being anticipated by the teaching of Jackson in U.S. Patent No. 5,236,602 (Jackson).

Applicant disagrees that the teaching of Jackson anticipates the subject matter of claims 31, 32, 36-38 41-43, and 49. Jackson teaches a dense fluid photochemical system for liquid substrate treatment. Jackson's system includes a vessel 30 defining a cleaning/reaction zone 32, wherein waste material is introduced through inlet pipe 34; an ultraviolet radiation means 36 producing ultraviolet radiation, which is introduced into reaction zone 32; as well as an inlet for an oxidizing or other reactive agent that is introduced to reaction zone 32 through inlet pipe 44; and an outlet pipe 48 from which treated waste material is removed. Jackson teaches a system that irradiates a fluid in the reaction zone with ultraviolet radiation. Significantly, "ultraviolet radiation [is] introduced into the reaction zone 32 by means of a quartz light pipe array which extends into the waste material 40 within the reaction zone 32." (Jackson at column 10, lines 3-7.) Jackson further teaches that "if an oxidizing or other reactive agent is used, it is introduced into the reaction zone 32 through inlet pipe 44." (Jackson at column 10, lines 16-18.) Thus, Jackson teaches irradiating the fluid to be treated which contains the waste material. To that end, Jackson discloses a system utilizing principles of operation like those disclosed by Haraga et al. in Japanese Publication No. JP411033542 (Haraga et al.).

However, Jackson does not teach a method of reducing oxygen demand in a water system comprising providing a low oxygen demand liquid to a hydroxyl free radical generator, irradiating the low oxygen demand liquid to generate hydroxyl free radicals, and adding the low oxygen demand liquid comprising hydroxyl free radicals to the water system such that the low

oxygen demand liquid is not water from the water system, or a method of reducing oxygen demand in a water system comprising providing a low oxygen demand liquid, not from the water system, to a hydroxyl free radical generator; generating hydroxyl free radicals in the low oxygen demand liquid; and adding the low oxygen demand liquid comprising hydroxyl free radicals to the water system. Jackson also does not teach a water system comprising a free radical generator comprising an inlet, an outlet, a channel disposed to allow fluid flow from the inlet to the outlet, and an ultraviolet radiation emission source disposed to irradiate any fluid through the channel; a body of water fluidly connected to the outlet of the free radical generator; and a substantially pure water source fluidly connected to the inlet such that the substantially pure water source comprises water not from the body of water.

Plainly stated, Jackson teaches a system that irradiates water having waste material with ultraviolet radiation, i.e. water from the water system, but does not teach a system that irradiates low oxygen demand water, not from the water system, or substantially pure water, not from the body of water. Therefore, the teaching of Jackson cannot anticipate the subject matter of independent claims 31, 41, and 49. Likewise, because dependent claims 32, 36-38, and 41-43 depend from independent claims 31 or 41, and thus recite additional features of the invention, the subject matter of these dependent claims cannot be anticipated by the teaching of Jackson.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. § 102(b).

#### Rejections under 35 U.S.C. § 103

Claim 33 stands rejected under 35 U.S.C. § 103 as being unpatentable over the teaching of Jackson in view of the teaching of Haraga et al.

There is no *prima facie* case of obviousness because none of the references provides any teaching, suggestion, or motivation to combine or modify their respective teachings as proposed.

Further, even if the teachings could have been combined as suggested, which Applicant does not concede, the proposed combination would not result in the invention as claimed. As discussed above, Jackson teaches a system that irradiates water having waste material with ultraviolet radiation, i.e. water from the water system, but does not teach a system that irradiates low oxygen demand water, not from the water system, or substantially pure water not from the body of water. Haraga et al. fails to address the deficiencies of the teaching of Jackson et al.

Notably, Haraga et al. also teaches irradiating the fluid to be treated, containing the organic matter but does not teach a system that irradiates low oxygen demand water, not from the water system, or substantially pure water, not from the body of water. Thus, even if the teachings of the references could have been combined, the proposed combination would not result in the invention as claimed.

Therefore, the subject matter of dependent claim 33 would not have been obvious over the teaching of Jackson in view of the teaching of Haraga et al.

Dependent claims 34, 35, 46-48, and 50-52 stand rejected under 35 U.S.C. § 103 as being unpatentable over the teaching of Jackson in view of the teaching of Gonzalez-Martin et al. in U.S. Patent No. 5,779,912 (Gonzalez-Martin et al.)

Preliminarily, there is no *prima facie* case of obviousness because none of the references provide any teaching, suggestion, or motivation to combine or modify their respective teachings. Further, even if the teachings of the references could have been combined, the proposed combination would not result in the invention as claimed. Gonzalez-Martin et al. teach photocatalytic oxidation of organics using a porous titanium dioxide membrane; thus, at best, the proposed combination would have resulted in a system with a reaction chamber utilizing titanium dioxide but would not have resulted in a system comprising a free radical generator connected to a substantially pure water source comprising water not from body of water, and that is connected to an outlet of the free radical generator or a method comprising adding low oxygen demand liquid comprising hydroxyl free radicals to the water system.

Therefore, the subject matter of dependent claims 34, 35, 46-48, and 50-52 would not have been obvious over the teaching of Jackson in view of the teaching of Gonzalez-Martin et al.

Dependent claims 39, 40, 44, and 45 stand rejected under 35 U.S.C. § 103 as being unpatentable over the teaching of Jackson in view of the teaching of Schulte et al. in U.S. Patent No. 5,348,665 (Schulte et al.).

Preliminarily, there is no *prima facie* case of obviousness because none of the references provide any teaching, suggestion, or motivation to combine or modify their respective teachings. Further, even if the teachings of the references could have been combined, the proposed combination would not result in the invention as claimed. Schulte et al. teach the degradation of

harmful substances in water by means of hydrogen peroxide under UV irradiation. Schlulte et al., however, fail teach irradiating a low oxygen demand liquid that is not water from the water system. Thus, the teaching of Schulte et al. fails to remedy the deficiencies of the teaching of Jackson.

Even if the teachings of each could have been combined, the resultant combination would not have resulted in the invention as claimed. The proposed combination would fail to teach a method comprising adding low oxygen demand liquid comprising hydroxyl free radicals to the water system.

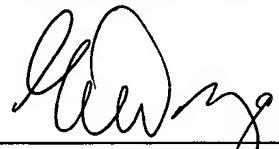
Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a).

### CONCLUSION

In view of the foregoing Amendments and Remarks, this application is in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes that the application is not in condition for allowance, the Examiner is requested to call Applicant's attorney at the telephone number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, which is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 50/0214.

Respectfully submitted,  
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